

Billings (F. S.)

Hog Cholera x x x



DR. SALMON'S LATEST. Hog Cholera and Swine Plague Two Distinct Diseases

Report of the Department of Agriculture,
1886, Reviewed by Frank S. Billings,
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periment Station of the State Univer-
sity of Nebraska.

Dr. Salmon introduces his portion of this report as follows: "In view of the results of investigations which have shown the existence of two distinct diseases in swine, perhaps of equal virulence and distribution, a change in the nomenclature becomes necessary in order to avoid any confusion in the future. Since these two diseases have been considered as one in the past, and the names swine plague and hog cholera have been applied indiscriminately, we prefer to retain both names with a more restricted meaning."

"Using the name hog cholera for the disease described in the last report as swine plague, which is produced by a motile bacterium."
"And applying the name swine plague to the other disease, (only lately discovered) the chief seat of which is in the lungs."

"This change is the more desirable since recent investigations have shown that the latter disease exists in Germany, where it is called swine plague. P. 603.

Before entering upon the discussion of this very unpleasant question, I desire to say, that it is not to oppose Dr. Salmon, as Mr. Salmon, that this review and criticism is written, but rather to force the question so upon the authorities at Washington that it must be brought to some definite conclusion before the end of another year. It is now some eight years since this department commenced investigations upon the disease of swine known as hog cholera and, with the exception of the admirable work of Dr. Detmers, nothing of importance has been added to our knowledge of that disease by any other worker. The work of Salmon has only added confusion to a subject which Dr. Detmers left in a comparatively clear light.

The present report of Salmon is such a mass of misstatements, errors and contradictions that its nature can only be described by one word, and that is imbecilic.

To make my own position plain I will say: First—That I unequivocally deny that there are two distinct diseases of swine which have been known heretofore either as hog cholera or swine plague.

Second—I deny that there are two distinct germs causing two distinct diseases known by either of these names.

Third—I positively assert that Salmon's assertion of a distinct germ for the disease which he now calls "hog cholera" is erroneous, and that the description of that object is a forgery; that it does not exist or occur in any form of the American swine plague, and that neither Salmon or anyone else can demonstrate the presence of that object in the tissues or blood of any hog that has died of swine plague in any part of this country, if the examination is made before cadaveric changes have taken place.

Fourth—That the object described by Salmon as the germ of hog cholera cannot be cultivated from the tissues of any animal that has died of hog cholera or swine plague. It now remains for me to prove the correctness of these assertions from the work of others.

It will be at first necessary to call attention to a very important fact that will probably escape the attention of the ordinary reader and non-professional reviewer, and that is that Dr. Salmon has been busied upon investigations of the diseases of swine for the agricultural department at Washington ever since the year 1878. That during that period he has enjoyed advantages for such work, not only superior to any other man in the country, but also as the only person in the country that was employed to do such work with the exceptions of Drs. Detmers and Law, neither of whom had his opportunities or assistants.

That up to the time of the issue of the last report of the department, 1878, Dr. Salmon never knew of but one disease to be called swine plague—which he now admits; that up to that time he considered the micro-organismal cause of that disease to be a micro-coccus, and that only—as may be seen by reading the following passage from the report of 1878: "Antipathetic to the conclusion which we arrived at later concerning the real cause of this puzzling disease, we must say, at this point, that we no longer consider a micrococcus as the cause of all outbreaks of the disease known as swine-plague," p. 180—and this assertion he reiterated as late as November, last, (see *Gazette*, November 1, 1886). The interesting question now comes to mind, what has become of those outbreaks of swine plague that are caused by that micrococcus? They were not mentioned in the report of 1886, and no allusion is made to them in that of 1886, notwithstanding the fact that Salmon spent all his time from 1879 to 1886 in discovering that micro-coccus and defending its position as the cause of American swine plague.

All that time was wasted! Thousands of dollars were wasted by Salmon in doing—nothing! When, then, did Salmon discover that there were two diseases caused by two different germs that were heretofore known as hog cholera or swine plague?

After German investigations had shown him that a germ having apparently the same appearance as that described by Detmers as far back as 1880 was the cause of the German swine plague. Why did he not then accept the Germans' description of that germ?

Why did he not then accept a description of an object which he cannot, nor any one else, derive from the tissues of swine that have died from the American swine plague?

Dr. Salmon's description is not that of a germ at all; it is that of a spore as every one who knows anything of bacteriology must admit who reads the description and studies his plates.

Salmon denies that the bacteria of the American swine plague develop spores, so that he knocks the bottom out of any argument that direction for the present. See p. 611, Report 1886, where he says:

"All the facts brought out by the study of this bacterium lead to the conclusion that a distinct spore state does not appear either within the animal body or in nature."

Finally die of marasmus, or general emaciation, but there are other things playing a role in the performance than the inflammation of the lungs. We must now return to Salmon's first condition of the differentiation of hog cholera from swine plague, and the germs are different. For the description of his germ of hog cholera he refers us to his report of 1885, where he says: "When stained for from one to two minutes in an aqueous solution of methyl-violet, they (the germs) appear as elongated ovals, chiefly in pairs. The greater number present a center pale, than the periphery. The darker portion is not located at the two poles," etc., p. 212.

I desire to call attention to the fact that Salmon admits that some do not "present a center pale" than the periphery," and also, that he is positive in asserting that "the darker portion is not located at the two poles."

It has been previously said that the above is a description of a spore and not a germ, and Salmon's illustrations in both the reports of 1885 and 1886 will bear out that assertion.

Of this nonentity of Salmon's the writer wrote in a paper published December, 1885:

"If Salmon knows anything of the chemical affinities of bacilli and bacteria, except spores, he knows that the description which he has given of this new microbe does not apply to any known form of bacteria, but to spores."

He seems to have then felt that he was treading upon dangerous ground in issuing such a description, for on page 611 (1885) he says:

"The pale center was certainly distinct, suggesting very strongly of spores." To which the writer appended: "What then is the distinguishing characteristic of spores?"

Hueppe, one of the most able authorities gives us the generally received definition as follows:

"That by the employment of aqueous or diluted alcoholic solutions the spores do not color."

Their outside cuticle does, however, and that is just the object which Salmon has described.

The bacteria of hog cholera do not develop spores, however!

Salmon was just as sure there was but one hog cholera in the country and that that one form was caused by a micrococcus up to 1885, as he was that that some hog cholera or swine plague was caused by another specific microbe, and that this microbe belongs to the species bacterium," in 1885 as he now is that there are two causes of swine plague and two forms of that disease.

What dependence can be placed upon such a contradictory observer?

The records of scientific investigation can be searched in vain for such a mass of contradictions as occur in Salmon's publications, except in the case of Pasteur, who, bacteriologically speaking, is a charlatan.

We must again call attention to Salmon's description of the manufactured germ of 1885.

"The darker portion is not located at the two poles as in the case of the micrococcus in rabbits," p. 212. In the report of 1886 he says:

"In most forms there is a slightly thicker border at the ends than at the sides of the short rod-like bodies"—p. 610.

Here is one concession!

The ends do stain in more than the sides! This time we have no qualification about the end staining somewhat. It is not "the greater number" which "present a center pale" than the periphery," but "in most forms there is a slightly thicker border at the ends than the sides."

The reader will be kind enough to remember that Salmon has asserted that there are two distinct swine plagues in this country, caused by two distinct germs. I will now give evidence that he is not sure upon this question, as well as show further contradictions of one of his disgusting character.

Early in March, 1886, he sent a Dr. Rose to Nebraska to make observations as to what was going on here, but ostensibly to collect material for study in Washington. It seems pretty expensive work to send a man that distance to collect specimens from hogs, when someone on the ground could have done it equally well, in the manner it was done. Had Mr. Rose been supplied with cultivating tubes and a spirit lamp and even instructed how to use them, he might have done himself some credit, as it was, "in only one case was the results successful," p. 627, 1886.

Of this result Salmon says: This new microbe, identical morphologically with the bacterium of hog cholera already described "ibid."

Again he says: "The disease caused by this germ, in its duration, symptoms and lesions in rabbits and mice, cannot be distinguished from that caused by the bacterium of hog cholera," p. 627, 1886.

Again, that "these lesions (in hogs this time) were as intense as any produced by feeding hog cholera bacteria obtained in the east" and "the identity of the two bacteria from Nebraska and the east was thus completely established," *ibid*.

The above assertion is, of course, true. The diseases are identical according to Salmon. The same page, however, Salmon is not so positive about this, for he says: "A liquid culture of the blood seemed a pure culture of a motile oval bacterium resembling closely the bacterium of hog cholera."

On the next page, 628, 1886, Salmon proceeds to give the differential characters of the hog cholera bacterium from Nebraska" of which he had said on the previous page, that the "identity of the two bacteria from Nebraska and the east was thus completely established."

How then could there possibly be any "differential characters" on the part of the Nebraska germ?

SALMON'S NEW SWINE PLAGUE AND ITS GERM.

In the *Breeders' Gazette* of Nov. 11, 1886, Dr. Salmon wrote: "I am glad to see that Dr. Billings has confirmed my work of 1884 by stating that he has discovered a micrococcus which corresponds in its microscopical appearances to that discovered and described by Schutz in the *Schweine-Seuche* of Germany."

The germ described by Salmon in his report of 1885, which represented his work of 1884, in no way corresponds to that discovered and described by me, Schutz, or Detmers.

But the present report gives evidence enough as to the character of the person we have as chief veterinarian of the United States both as an honorable man and an honest observer.

Above he has said, that Dr. Billings has confirmed his work of 1884.

In this report he seems to have forgotten all about that observation.

In this report, as said, he makes himself out as the most imbecilic author of "unfounded statements" that can be found, for he himself brands his own statement in the *Gazette* as a lie when he says:

"Although the investigations concerning the nature of this microbe are scarcely begun," etc., p. 659, 1886.

How then could he have described it in 1884?

On page 618 he admits that somebody has found the bacterium of his swine plague before him, but in a very peculiar manner for an honest investigator. He says:

"In view of the fact that another bacterium (he is writing about his h. c. h. h. at the time) has been recently found associated with lung disease and is probably the cause."

If, then, Salmon's investigations "are scarcely begun," and as it is the one discovered by Dr. Billings alluded to above, how in the name of ordinary intelligence could my work confirm that of Salmon's in 1884, the so well known fact, which he now shatters all to pieces?

Salmon's study of this germ can certainly be "scarcely begun," if we are to judge from his very meagre description, but this much we will quote:

"The two extremities of the longer axis are deeply stained. Between these colored masses a transverse band remains transparent without any color,"—p. 671, 1886.

November last the writer gave the following short description of the appearances of this organism:

"This germ, according to Koch's definition, is a bacterium. It is oval, its polar portion being differentiated from that in the middle of its body by staining quite intensely, while the intermediate portion does not take up any color when the application of the coloring material has not been too intense. It colors best in methyl-violet, gentian-violet and methylene-blue, in the order named; all other colors are rejected, so well in fact, that it is not at all as dahlia or negrosin; i. e. micromorphologically it bears a marked resemblance to the organism described by Schutz of Berlin as the cause of the German 'Schweine seuche'—swine plague."

uniform width around the entire circumference of the oval." Report 1885, page 312. Salmon seems to have remembered this contradiction, so he corrected himself at once as follows: "There seems to be slightly more stained material at the two extremities than in the bacterium described in the last report," Page 661, 1886. The reader will observe that Salmon is not sure about this. It "seems to be" so, but a glance at his illustrations will show something more than a "seeming" difference in this direction, and above he has told us that "the two extremities of the longer axis are deeply stained." This is not "seems to be," it is *is*!

The original discovery of the germ of American swine plague does not belong to me, however; or if the diseases are identical, to Loeffler. Salmon, who has not really discovered it at all, but accidentally found out that it was there after somebody else had told him so.

This discovery belongs to Dr. Detmers of the agricultural college of Ohio, and was made in 1879, who gave a very accurate description of the object, though mistaken with regard to the vital phenomena. It is to the eternal disgrace of Dr. Salmon as an investigator, as a veterinarian, and as an American, that he has utterly ignored this work, and caused it to pass into almost complete forgetfulness.

I am perfectly well aware that Loeffler tries to claim priority over Detmers, but he had better learn English so as to understand it before he stultifies his reputation in any such manner. To Detmers belongs the honor, not only of being the first discoverer of this germ, which is the true and only germ of American swine plague, but also that of doing the only trustworthy work upon the subject that has ever been done under the auspices of the United States government.

Detmers' description of this germ are to be found in the report of the department, 1880-81, pages 185 to 187, and the *American Naturalist*, volume XVI, pages 200-201.

SALMON'S CONTRADICTIONS WITH REGARD TO THIS GERM.

The first description of it is in connection with eight post mortems made in Illinois and described on pages 660-661, of which he says: "Because the cultures in the autopsy notes at least ten others were made at the time." * * * None of these showed any signs of growth."

What shall we say then when a few lines further down the page we read:

"We will now proceed to a description of the bacteriological investigations of cultures, none of which showed any signs of growth." () yet in two tubes inoculated from No. 6, two microbes were found which deserve attention."

The next line is interesting.

"One (germ) grew in both tubes which was more carefully examined because it resembled the bacterium of hog cholera very closely."

Salmon will now tell us that the "bacterium of H. C." is "motile liquids" while that of the swine plague is "non-motile in liquids,"—p. 674, *ibid*. "No spontaneous movement can be observed,"—p. 672; see also p. 682, where the same differentiation is pointed out.

The fact is the true germ of the American swine plague, the one described by Detmers and the writer, is motile in fluid cultures and Salmon knows it and has recorded it as may be seen in the following quotations, although they directly contradict his previously quoted assertions.

On page 661 he says of the germ which he says it is "non-motile in liquids" that in liquids it is again "motile." On page 662 he again says:

"In one of the tubes just described a motile bacterium * * * which has reference to the same germ. Then why did Salmon say that it was "non-motile"? The reason is easy to discover.

Because, Schutz had said the German organism of hog cholera was "non-motile" in blooddrops, and Salmon this time falls back on Schutz for support, and has therefore proclaimed the two diseases identical.

We are by no means sure that Schutz bacterium is "non-motile" in fluids.

I am not sure that Schutz is on safe ground with all his conclusions as to the German swine plague by any means, as I shall show very soon.

FURTHER EVIDENCE.

In his summary showing the difference between his manufactured germ and the true germ of swine plague, Salmon says: "The latter failed to grow on potatoes" (p. 674) in order to distinguish it from the former which grows luxuriantly on potatoes, but he apparently forgets that on page 661 of the same report he had already written of this same germ of which the "growth on potatoes fails," that "on potatoes a thick straw colored shining layer of nearly smooth surface grows, which grows very vigorously and gradually covers the entire surface of the potato."

This is correct, and his illustration of such a growth, which, however, he ascribes to his imaginary germ, exactly corresponds to that observed by me for the true germ, but I have used the same color to describe it, which is the color he gives in his illustration, and not "straw colored;" but then they are troubled in their eyes at Washington, which probably accounts for it.

In this regard it may be not be uninteresting to note that Loeffler says that the germ discovered by him does not grow on potatoes, although he made a number of attempts, but that Schutz claims that that germ is identical with the one which he has shown to be the cause of the German swine plague, but not entirely with good reason. It is singular that Schutz does not mention a thing about the growth of his germ on potatoes.

If it should prove that the germ of the German swine plague does grow on potatoes, which assertion I take *cum grano salis*, then there is one point of differentiation between that organism and that of the American disease, and if it is non-motile in fluid cultures, we have another.

The writer knows Prof. Schutz very well. If Loeffler should say "thing grew on potatoes" that would be all right. As you please. "As you please," should say a thing did not grow potatoes" Schutz again would reply: "As you please."

He never has had courage to contradict those who bore a superior reputation to himself.

However, this has no reference to Salmon's misrepresentations and contradictions. Attention has already been called to his saying that the German swine plague fails to grow on potatoes while that of his hog cholera does grow on potatoes. Hence I desire to call attention to another "unwarranted statement," which follows on the last quotation from him where he says the germ of swine plague does grow on potatoes, and then tells how this germ differs from that of the hog cholera, namely, in the following words:

"This growth is brighter in color and more abundant than appears in the potato cultures of the bacterium of hog cholera." *Ibid* 1886, p. 661.

That should settle the potato question.

Why did not Salmon show this differentiation in his plates?

OTHER CONTRADICTIONS BY SALMON.

With regard to his bacterium of swine plague Salmon again says:

"That it was not the bacterium of hog cholera was shown by another work of pathogenic properties when inoculated into mice and rabbits." *Ibid* 1886, p. 662.

But his memory must be of a more indescribable nature than his knowledge of the germ of swine plague, for on page 668 of the same report he says of the same object:

"This microbe was therefore fatal to mice, rabbits, and pigs."

"Rabbits, mice and pigeons were thus shown to be susceptible." *Ibid* 1886, p. 665.

"Mice destroyed but not invariably, in two to six days." Summary, p. 674, 1886.

"In rabbits inoculation destroys life in from three to six days." *Ibid*.

There is no evidence of this kind, but it is unnecessary to note.

It was my intention to show by actual quotations from Salmon's autopsies that many of them would suit either of the diseases which he claims are distinct in every other way, but a careful reader of his later mystification will see that he has left a hole open by which to jump in any conclusion, as follows, should the facts be quoted against him, as follows:

"Our investigations have shown the existence of another bacterial disease in swine which may even be associated with hog cholera in the same herd and the same animal." Page 682.

"In hog cholera lung lesions are quite secondary and only incidentally seen." *Ibid*, page 682, 1886.

"In the same stuff we have nothing to say except that it is unequivocally false."

The fact is Salmon is preferring the way to drop his manufactured swindle, his germ of hog cholera, and to take up the true article next year.

I wish also to deny another assertion of Salmon's, which is that the germ of true American swine plague is a micrococcus germ causes "sclerosis of the liver." It does not.

The correctness of my assertion is well shown by the following quotation from Salmon which shows his utter want of any knowledge of the principles of pathology. He says: "There was, moreover, a partial sclerosis of the liver in most of the animals examined which we never encountered in hog cholera."

"We must remember, however, that of these eight cases, five were killed, perhaps in the early stages of the disease, before the lesions were well marked." Page 661, 1886.

This is a question that will not interest the lay reader, but I will only say that any one who knows anything about intestinal inflammation of the liver, knows that it is absolutely impossible for it to occur and be caused by bacteria in the early stages of a disease of not over twenty days' duration even in protracted cases, as a general thing.

Salmon never saw one single case of sclerosis of the liver, and yet he says that his bacterium connected with American swine plague!

THE NATURE OF SWINE PLAGUE.

The writer has seen the characteristic septicæmia, and any one at all acquainted with the lesions possible or even common to any fatal form of septicæmia will see how conformable all the different phases of the American swine plague are to such a definition.

Salmon has induced Schutz to support him in his endeavor to build up a new hog disease in this country, hence I will close by considering the German side of the question in a rather critical manner.

Loeffler comes to the following conclusion:

"By the great importance which the diseases of swine have from an economic standpoint, their extended bacteriological investigation should soon bring us to definite conclusions, if the bacteria produce a disease belonging in the group of the erysipelas diseases, or if one is justified in looking upon these organisms as belonging to another specific disease of swine, viz.: 'Schweine-Septicæmia'."

And therefore to be distinguished from genuine erysipelas of those animals."

Schutz says on this point: "The previous experiments show that mice and rabbits which have been inoculated with small pieces of the spleen from a diseased swine become infected with septicæmia, and that in the spleen and tissues were to be found the same bacteria that infected the spleen of the hog, that is, the oval bacteria. Consequently it was proven that the spleen of hogs had patho-genetic action, and that the bacteria are the cause of this action. Hence, their inoculation upon mice and rabbits produced the same disease as is produced by the direct inoculation of pieces of spleen from a diseased swine." Arbeiten, a. d. k. Gesundheits Amt, p. 383.

The reader will please observe, that Schutz has said in the passage above quoted, that the mice and rabbits which were inoculated with small pieces of spleen from diseased swine (swine septicæmia) became infected with septicæmia, that is, derive septicæmia and die therefrom, and again, "Rein kulturen fortgezüchteten bacterien hatten, nach ihrer Verimpfung auf Mause und Kaninchen dieselbe krankheit, hervorgerufen, wie die verimpften milch stücke," which rendered into English is, that pure culture of the bacteria, when inoculated upon mice and rabbits, produced the same disease as pieces of the spleen of a swine that had recently died of swine plague.

The necessity of presenting these facts from Schutz' work will be self evident when one reads the following words upon a later page of the same work: "Denn es steht nun mehr fest, die durch die valen. Bacterien bedingte, und als Schweineseuche bezeichnete krankheit auch keine septicæmia im eigentlichen sinne des wortes, sondern eine infectiose pneumonie ist," *ibid*, p. 402, that is, it is now proven that the disease which is caused by the oval bacteria and known as swine plague is not a septicæmia in the common sense of the word, but an infectious pneumonia.

Schutz seems to have forgotten that he had previously written that the disease produced in mice and rabbits by these same oval bacteria was a "septicæmia" and that it was the same disease as was produced by inoculations with small pieces of spleen of swine that had died of swine plague.

If this is not a *contradictio ad absurdum* I do not know what is?

But even after writing the last passage, quoted from the original, Schutz does not seem to be by any means sure of the correctness of his conclusion, that swine plague is indeed an "infectious pneumonia." Bacterien "No" for he immediately qualifies that conclusion as follows:

"Notwithstanding, I prefer to hold to the name *schweine-seuche* (swine plague) for the time being, as will be shown later, it is not proven to a certainty, that the lungs are the only point by which the disease producing bacteria enter the porcine organism." *Ibid*, p. 402.

It should be known that Prof. Schutz's investigations are based upon a very limited number of swine at the laboratory of the Berlin Veterinary school, and that he had at that time never made any study of this very variable disease, in so far as the lesions produced are concerned, by practical study among the hogs of Germany in their runs and pens. Had he been enabled to do this, I have no doubt that he would have reached the same conclusion as Hueppe, viz.: That the disease is a septicæmia, and that aside from the complications of the liver, kidneys and other dense paranclymatous organs, that that of the lungs or intestines is a mere complement of the disease, as is the case of the pneumonia which frequently complicates and proves fatal in many other severe infectious diseases in man. There is nothing specific in the inflammation of the lungs in such cases. It is but a natural result, if the disease continues long enough, which must follow in all cases where there is an active and passive congestion of the lungs from the resistance to circulatory action caused by the acute inflammation and swollen condition of the liver and kidneys, especially the non or checked secretive action of the latter organs, and again of the severe disturbance of the muscles of the heart which cause it to lose in contractile and driving energy. The bacteria also play a part in directly causing this calamitous complication in that they retard and obstruct the circulation, being so many grains of fine powder distributed through the blood.

Desiring as far as possible to keep the "I" out of my writings still it is but just to myself for me to say that the writer was the first to assert and give evidence that our American swine plague is not a septicæmia, but a disease of the lungs and intestines, and that he still holds to that opinion and is positively confident that future investigators will and must come to the same conclusion.

No other definition of the disease will explain its peculiar variations in different outbreaks and in different members of the swine in the same herd in a single eruption. I must express my surprise that as experienced a person as Schutz should have been so stupid as to draw such a conclusion with regard to the nature of swine plague, especially as he gives abundant practical evidence that he had before him cases of swine plague which did not fit into the form of his infectious pneumonia."

In fact all through his article can be seen evidence that he doubts the correctness of his own conclusions and nowhere more strongly than with reference to the results of Roloff's investigations, as will be presently shown.

Salmon was perfectly well acquainted with the nature of the conclusions arrived at in Nebraska. His whole report is so directed as* to throw discredit upon them with utter disregard of the truth, hence he falls back on Schutz for support of his own misstatements that there are two "swine plagues" in this country, one of which is a pneumonia, that is, one to save his skin and paper, and the other, against every principle of common sense and every evidence of practical observation, to give something new to his pneumonia, so he calls it "chronic," which is absurd, as I have shown in another place.

That he could not have carefully read Schutz' work must be apparent when one sees that he utterly failed in observing the contradictions and uncertainties in the same, and especially failed to value Schutz's reference to Roloff's investigations which I had published last year in the hopes of calling the attention of Germans to their value before they followed Schutz and accepted his conclusion, that their swine plague is an "infectious pneumonia."

Salmon is as unfortunate in the selection of his support as he was when he fell back on Pasteur to bolster up his coec-i of the years 1880 to 1886. His own eyes seem to be severely afflicted. He gives evidence that both his visual and intellectual eyes must have been more severely afflicted with the coec-i disease than any one of our American swine plague men.

Although I utterly ignore Salmon's attempt to make a new disease out of our swine plague, to which he has given the name, hog cholera, and with even more positiveness declare the object which he describes to be the bacterium of that disease to be a forgery; still I desire to show by quotations how careful this person has been to evade all evidence which did not serve his purpose.

Salmon says of "The relation of hog cholera (his) to this disease;" (German swine plague):

"A careful perusal of this brief synopsis will convince even those who have only observed the gross pathological lesions that are constantly met with in hog cholera, or who have read the

post mortem notes in this and the former report, that this new disease, described by Schutz, has nothing in common with hog cholera." The description is new, not the disease, which is probably as old as the Biblical record.

Now let us see if we cannot find some evaded evidence in Schutz' report which will largely tend to contradict the above assertion of Salmon's and which will still further go to show that they have Salmon's hog cholera in Germany, and that his peculiar and especial nonentity, the bacterium of Salmon cholera, is a forgery.

First, I will quote from Roloff, who says: "The surface of the large intestine presents large brown red spots in many places, in which one sees many delicate and injected blood-vessels. Other portions of the serosa are of a diffuse red, while others are yellowish and quite pale."

Particular attention is called to the next quotation, however:

"The ileo-caecal valve extends into the cavity of the intestines as an elongated, dense and cylindrical body. The surface of this portion of the intestine is of a leaden color, its continuity being interrupted by numerous small indentations or openings of the size of a pin's head. The crown of the valve is frequently ulcerated or evaded."

"The mucosa of the cecum, in the vicinity of the valve, is very uneven and of a grayish black color in many places, the surface being frequently broken by small clefts. * * * Similarly changes are to be found in other parts of the large intestine. One also sees round or oval elevations, varying from a 10 cent piece to a quarter of a dollar, which are whitish, black or grayish black surface, the same becoming paler towards the limits of these objects; this surface is also marked by numerous clefts and is very irregular. They diminish in thickness from their center toward their outside limits. Their superficial tissues are even, dry and friable, especially in the middle of the object, but have more moisture and tenacity towards the edges. Small, but less prominent objects are to be seen in the vicinity of the larger ones. These pathological productions frequently coalesce and form large patches in close proximity to one another. Their location upon and in the wall of the intestine corresponds to the circumference of the intestine and rejected parts which were observed in the external covering." Die Schwindnucht Fettleige Degeneration, Scrophulose und Tuberkulose bei Schweinen 1875.

The question I now desire Mr. Salmon to answer is: Will he accept the above as a genuine swine plague, or will he stand in the case of his "hog cholera" or not, or will be like a contemptible tool of his, the state veterinarian of Nebraska, so green as to call such a cecum "the stomach?"

The above is too plain evidence for Mr. Salmon to deny that it belongs to hog cholera. Now let us